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Total Pages : 03

**July-22-00264**

**B. Tech. EXAMINATION, 2022**

Semester IV (CBCS)

PULSE SHAPING AND WAVE GENERATION

EC-404

*Time : 3 Hours*

*Maximum Marks : 60*

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*The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.*

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**Note** : Attempt *Five* questions in all, selecting *one* question from each Sections A, B, C and D. Q. No. 9 is compulsory.

**Section A**

1. What is the main limitation of an RC differentiator ?  
How is the problem overcome with an op-amp ? **10**
2. Describe a ringing circuit as a special case of under damped RLC circuit. **10**

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### Section B

3. Sketch and describe the working of the following clipping circuits : **10**
- (a) Series diode negative limiting circuit
  - (b) Parallel-diode positive limiting circuit.
4. Write the clamping operation for positive clamping and state the application of clamping circuit. **10**

### Section C

5. Explain the construction and principle of UJT with clear diagram. **10**
6. Sketch the PIN diagram of 555 timer with its description. Explain the Astable multivibrator with IC 555 timer. **10**

### Section D

7. Derive an expression for the gate width of a collector coupled transistor monostable multivibrator when the first transistor  $Q_1$  is in saturation. **10**
8. Write a short note on Analog to Digital Converter. **10**

### (Compulsory Question)

9. Answer the following : **10×2=20**
- (a) A ramp waveform  $v_i(t) = \alpha t$  during the time interval  $0 < t < T$ , is transmitted through an RC low-pass filter with  $RC \gg T$ . What will be the equation of output waveform ?
  - (b) What is the condition for RC low-pass filter to act as good integrator ?
  - (c) Give some general features of a time base signal.
  - (d) Name the methods for generating time base waveforms.
  - (e) What are the applications of 555 timer IC ?
  - (f) Write the applications of sampling gates.
  - (g) When does a transistor Schmitt trigger circuit fail to convert a periodic waveform into a square waveform ?
  - (h) A 5-bit ladder has a digital input of 11010. Assuming that 0 corresponds to 0V and 1 corresponds to + 10 V. What will be its output ?
  - (i) List different types of clampers.
  - (j) Write the application of Digital to Analog converters.